WHAT IS CLAIMED IS:

1. A high pixel density optical image sensor comprising a plurality of organic photosensors arrayed on a common substrate, said photosensors each comprising an active layer comprising a conjugated semiconducting polymer bounded on one side by a first electrode and on the other side by a second electrode, with a detector bridging the first and second electrodes and capable of detecting an electrical output from the photosensor in response to the incident light sensed by the photosensor.

2. The image sensor of claim 1 wherein the incident light has multiple spectral bands and wherein more then one spectral band is sensed.

3. A sensing element capable of sensing more than one wavelength of light comprising

a. a substrate;

b. a first electrode disposed on the substrate;

c. a first layer of a first photoactive organic material having an optical band gap corresponding to a first of the more than one wavelengths disposed on a first portion of the first electrode;

d. a transparent second electrode disposed on the layer of first photoactive organic material, said first electrode, first layer of first photoactive organic material and said second electrode making up a first sensor capable of generating an electrical signal when light of the first wavelength is incident upon said first sensor;

e. a second layer of a second photoactive organic material having an optical band gap corresponding to a second of the more than one wavelengths disposed on a second portion of the first electrode;

f. a transparent third electrode disposed on the layer of second photoactive organic material, said first electrode, said layer of second photoactive organic material and said third electrode making up a second sensor capable of

generating an electrical signal when light of the second wavelength is incident upon said second sensor.

4. A sensing element of claim 3 adopted for full visual color image comprising

a. a substrate;

b. a first electrode disposed on the substrate;

c. a first layer of a first photoactive organic material having an optical band gap at about 700 nm disposed on a first portion of the first electrode;

d. a transparent second electrode disposed on the layer of first photoactive organic material, said first electrode, first layer of first photoactive organic material and said second electrode making up a red sensor capable of generating an electrical signal when red light is incident upon said red sensor;

e. a second layer of a second photoactive organic material having an optical band gap at about 600 nm disposed on a second portion of the first electrode;

f. a transparent third electrode disposed on the layer of second photoactive organic material, said first electrode, said layer of second photoactive organic material and said third electrode making up a green sensor capable of generating an electrical signal when green light is incident upon said green sensor;

g. a third layer of a third photoactive organic material having an optical band gap at about 500 nm disposed on a third portion of said first electrode;

h. a transparent fourth electrode disposed on the layer of third photoactive organic material; said first electrode, said layer of third photoactive organic material and said fourth electrode making up a blue sensor capable of generating an electrical signal when blue light is incident upon said blue sensor.

5. The image sensing element of claim 4 wherein the first, second, and third portions of said first electrode are continuous.

6. The image sensing element of claim 4 wherein the first, second, and third portions of said first electrode are separate.

7. The image sensing element of claim 4 wherein said layer of second photoactive organic material covers the red sensor and functions as a short wavelength cut filter and wherein said layer of third photoactive organic material covers the green sensor and green sensor and functions as a mid wavelength cut filter.

8. A sensing element capable of sensing more than one wavelength of light comprising

a. a transparent substrate;

b. a transparent first electrode disposed on the substrate;

c. a first layer of a first photoactive organic material having an optical band gap corresponding to a first of the more than one wavelengths disposed on a first portion of the first electrode;

d. a transparent second electrode disposed on the layer of first photoactive organic material, said first electrode, first layer of first photoactive organic material and said second electrode making up a first sensor capable of generating an electrical signal when light of the first wavelength is incident upon said first sensor;

e. a second layer of a second photoactive organic material having an optical band gap corresponding to a second of the more than one wavelengths disposed on a second portion of the first electrode;

f. a third electrode disposed on the layer of second photoactive organic material, said first electrode, said layer of second photoactive organic material and said third electrode making up a second sensor capable of generating an electrical signal when light of the second wavelength is incident upon said second sensor.

9. A sensing element of claim 8 adopted for full color visual image sensing comprising

a. a transparent substrate;

b. a first transparent electrode disposed on the substrate;

c. a first layer of a first photoactive organic material having an optical band gap at about 500 nm disposed on a first portion of the first electrode;

d. a transparent second electrode disposed on the layer of first photoactive organic material, said first electrode, first layer of first photoactive organic material and said second electrode making up a blue sensor capable of generating an electrical signal when blue light is incident upon said blue sensor;

e. a second layer of a second photoactive organic material having an optical band gap at about 600 nm disposed on a second portion of the first electrode;

f. a transparent third electrode disposed on the layer of second photoactive organic material, said first electrode, said layer of second photoactive organic material and said third electrode making up a green sensor capable of generating an electrical signal when green light is incident upon said green sensor;

g. a third layer of a third photoactive organic material having an optical band gap at about 700 nm disposed on a third portion of said first electrode;

h. a fourth electrode disposed on the layer of third photoactive organic material; said first electrode, said layer of third photoactive organic material and said fourth electrode making up a red sensor capable of generating an electrical signal when red light is incident upon said red sensor.

10. The image sensing element of claim 9 wherein said layer of second photoactive organic material covers the blue sensor and functions as a mid wavelength cut filter and wherein said layer of first photoactive organic material covers the blue sensor and green sensor and functions as a short wavelength cut filter.

11. A sensing element capable of sensing more than one wavelength of light comprising

a. a substrate;

b. a first electrode disposed on the substrate;

c. a first layer of a first photoactive organic material having an optical band gap corresponding to a first of the more than one wavelengths disposed on the first electrode;

d. a transparent second electrode disposed on the layer of first photoactive organic material, said first electrode, said first layer of first photoactive organic material and said second electrode making up a first sensor capable of generating an electrical signal when light of the first wavelength is incident upon said first sensor;

e. a second layer of a second photoactive organic material having an optical band gap corresponding to a second of the more than one wavelengths disposed on the transparent second electrode;

f. a transparent third electrode disposed on the layer of second photoactive organic material, said second electrode, said layer of second photoactive organic material and said third electrode making up a second sensor capable of generating an electrical signal when light of the second wavelength is incident upon said second sensor.

12. A sensing element of claim 11 adapted for full color visual image sensing comprising

a. a substrate;

b. a first electrode disposed on the substrate;

c. a first layer of a first photoactive organic material having an optical band gap at about 700 nm disposed on the first electrode;

d. a transparent second electrode disposed on the layer of first photoactive organic material, said first electrode, first layer of first photoactive organic material and said second electrode making up a red sensor capable of generating an electrical signal when red light is incident upon said red sensor;

e. a second layer of a second photoactive organic material having an optical band gap at about 600 nm disposed on the second electrode;

f. a transparent third electrode disposed on the layer of second photoactive organic material, said second electrode, said layer of second photoactive organic material and said third electrode making up a green sensor capable of generating an electrical signal when green light is incident upon said green sensor;

g. a third layer of a third photoactive organic material having an optical band gap at about 500 nm disposed on the third portion electrode;

h. a transparent fourth electrode disposed on the layer of third photoactive organic material; said third electrode, said layer of third photoactive organic material and said fourth electrode making up a blue sensor capable of generating an electrical signal when blue light is incident upon said blue sensor.

13. A sensing element capable of sensing more than one wavelength of light comprising

a. a transparent substrate;

b. a transparent first electrode disposed on the substrate;

c. a first layer of a first photoactive organic material having an optical band gap corresponding to a first of the more than one wavelengths disposed on the first electrode;

d. a transparent second electrode disposed on the layer of first photoactive organic material, said first electrode, first layer of first photoactive organic material and said second electrode making up a first sensor capable of generating an electrical signal when light of the first wavelength is incident upon said first sensor;

e. a second layer of a second photoactive organic material having an optical band gap corresponding to a second of the new the one wavelengths disposed on the second electrode;

f. a third electrode disposed on the layer of second photoactive organic material, said first electrode, said layer of second photoactive material and said third electrode making up a second sensor capable of generating an electrical signal when electromagnetic radiation of the second wavelength is incident upon said second sensor.

14. A sensing element of claim 13 adapted for full color visual image sensing comprising

a. a transparent substrate;

b. a first transparent electrode disposed on the substrate;

c. a first layer of a first photoactive organic material having an optical band gap at about 500 nm disposed on the first electrode;

d. a transparent second electrode disposed on the layer of first photoactive organic material, said first electrode, first layer of first photoactive organic material and said second electrode making up a blue sensor capable of generating an electrical signal when blue light is incident upon said blue sensor;

e. a second layer of a second photoactive organic material having an optical band gap at about 600 nm disposed on the second electrode;

f. a transparent third electrode disposed on the layer of second photoactive organic material, said second electrode, said layer of second photoactive organic material and said third electrode making up a green sensor capable of generating an electrical signal when green light is incident upon said green sensor;

g. a third layer of a third photoactive organic material having an optical band gap at about 700 nm disposed on the third electrode;

h. a fourth electrode disposed on the layer of third photoactive organic material; said third electrode, said layer of third photoactive organic material and said fourth electrode making up a red sensor capable of generating an electrical signal when red light is incident upon said red sensor.

15. A sensing element capable of sensing more than one wavelength of light comprising

a. a substrate;

b. a first electrode disposed on the substrate;

c. a first layer of a first photoactive organic material having an optical band gap corresponding to a first of the more than one wavelengths disposed on the first electrode;

d. a transparent second electrode disposed on the layer of first photoactive organic material, said first electrode, first layer of first photoactive organic material and said second electrode making up a first sensor capable of generating an electrical signal when light of the first wavelength is incident upon said first sensor;

e. a dielectric layer disposed on the second transparent electrode;

f. a transparent third electrode disposed on said dielectric layer;

g. a second layer of a second photoactive organic material having an optical band gap corresponding to a second of the more than one wavelengths disposed on the third electrode;

h. a transparent fourth electrode disposed on the layer of second photoactive organic material, said third electrode, said second layer of second photoactive organic material and said fourth electrode making up a second sensor capable of generating an electrical signal when light of the second wavelength is incident upon said second sensor.

16. A sensing element of claim 15 adapted for full color visual image sensing comprising

a. a substrate;

b. a first electrode disposed on the substrate;

c. a first layer of a first photoactive organic material having an optical band gap at about 700 nm disposed on the first electrode;

d. a transparent second electrode disposed on the layer of first photoactive organic material, said first electrode, first layer of first photoactive organic material and said second electrode making up a red sensor capable of generating an electrical signal when red light is incident upon said red sensor;

e. a first dielectric layer disposed on the second transparent electrode;

f. a transparent third electrode disposed on said first dielectric layer;

g. a second layer of a second photoactive organic material having an optical band gap at about 600 nm disposed on the third electrode;

h. a transparent fourth electrode disposed on the layer of second photoactive organic material, said third electrode, said layer of second photoactive organic material and said fourth electrode making up a green sensor capable of generating an electrical signal when green light is incident upon said green sensor;

i. a second dielectric layer disposed on the fourth electrode;

j. a transparent fifth electrode disposed on said second dielectric layer;

k. a third layer of a third photoactive organic material having an optical band gap at about 500 nm disposed on the fifth portion electrode;

l. a transparent sixth electrode disposed on the layer of third photoactive organic material; said fifth electrode, said layer of third photoactive organic material and said sixth electrode making up a blue sensor capable of generating an electrical signal when blue light is incident upon said blue sensor.

17. A sensing element capable of sensing more than one wavelength of light comprising

a. a transparent substrate;

b. a first transparent electrode disposed on the substrate;

c. a first layer of a first photoactive organic material having an optical band gap corresponding to a first of the more than one wavelengths disposed on the first electrode;

d. a transparent second electrode disposed on the layer of first photoactive organic material, said first electrode, first layer of first photoactive organic material and said second electrode making up a first sensor capable of generating an electrical signal when light of the first wavelength is incident upon said first sensor;

e. a dielectric layer disposed on the second transparent electrode;

f. a transparent third electrode disposed on said dielectric layer;

g. a second layer of a second photoactive organic material having an optical band gap corresponding to a second of the more than one wavelengths disposed on the third electrode;

h. a fourth electrode disposed on the layer of second photoactive organic material, said third electrode, said second layer of second photoactive organic material and said fourth electrode making up a second sensor capable of generating an electrical signal when light of the second wavelength is incident upon said second sensor.

18. A sensing element of claim 15 adapted for full color visual image sensing comprising

a. a transparent substrate;

b. a first transparent electrode disposed on the substrate;

c. a first layer of a first photoactive organic material having an optical band gap at about 700 nm disposed on the first electrode;

d. a transparent second electrode disposed on the layer of first photoactive organic material, said first electrode, first layer of first photoactive organic material and said second electrode making up a red sensor capable of generating an electrical signal when red light is incident upon said red sensor;

e. a first dielectric layer disposed on the second transparent electrode;

f. a transparent third electrode disposed on said first dielectric layer;

g. a second layer of a second photoactive organic material having an optical band gap at about 600 nm disposed on the third electrode;

h. a transparent fourth electrode disposed on the layer of second photoactive organic material, said third electrode, said layer of second photoactive organic material and said fourth electrode making up a green sensor capable of generating an electrical signal when green light is incident upon said green sensor;

i. a second dielectric layer disposed on the fourth electrode;

j. a transparent fifth electrode disposed on said second dielectric layer;

k. a third layer of a third photoactive organic material having an optical band gap at about 500 nm disposed on the fifth portion electrode;

l. a sixth electrode disposed on the layer of third photoactive organic material; said fifth electrode, said layer of third photoactive organic material and said sixth electrode making up a blue sensor capable of generating an electrical signal when blue light is incident upon said blue sensor.

19. A sensing element capable of sensing more than one wavelength of light comprising a sensor having

a. a first electrode;

b. a layer of a photoactive organic material disposed on the first electrode; and

c. a transparent second electrode disposed on the layer of photoactive organic material, said first electrode, layer of first photoactive organic material and said second electrode making up a sensor capable of generating an electrical signal when a beam of light having several wavelengths is incident upon said second electrode; and

means for discriminating among the several wavelengths in said beam of light such that only a portion of the several wavelengths is incident upon the second electrode at one time.

20. The sensing element of claim 19 wherein the means for discriminating is a filter.

21. The sensing element of claim 19 wherein the means for discriminating is a plurality of filters.

22. The sensing element of claim 19 wherein the means for discriminating is a variable color filter.

23. The sensing element of claim 19 wherein the variable color filter is a liquid crystal filter comprised of a first filter electrode and a second filter electrode bounding a liquid crystal layer with means for applying a bias voltage across the first filter electrode and the second filter electrode, said bias voltage varying the wavelength of light passing through said variable color filter.

24. The sensing element of claim 19 wherein the means for discriminating comprises an etalon.

25. The sensing element of claim 19 wherein the means for discriminating comprises a plurality of etalons which transmit at different wavelengths.

26. The sensing element of claim 19 wherein the means for discriminating comprises a diffraction device for separating the beam of light into its separate wavelengths with the sensor sensing a portion of the separated wavelengths.

27. The sensing element of claim 26 wherein the diffraction device comprises a prism.

28. The sensing element of claim 26 wherein the diffraction device comprises a grating.

29. The sensing element of claim 26 comprising a plurality of image sensors with a common means for discriminating with individual sensors sensing individual wavelengths.

30. The sensing element of claim 3 wherein one or more of said electrodes comprises a conductive organic material.

31. The sensing element of claim 3 wherein one or more of said electrodes comprises a metal.

32. The sensing element of claim 3 wherein the photoactive organic material comprises a material selected from the group consisting of organometallic molecules, conjugated polymers and semiconducting polymers.

33. The sensing element of claim 3 wherein the photoactive organic material comprises a conjugated, semiconducting polymers.

34. The sensing element of claim 3 additionally comprising a buffer layer between an electrode and an adjacent photoactive organic material layer.

35. The sensing element of claim 34, wherein the buffer layer comprises conducting polymers, such as polyaniline (PANI), polypyrrole (PPy), and polyethylene dioxythiophene polystyrene sulfonate (PEDT-OSS); a thin layer of organic or organometallic molecules; a thin layer of inorganic compounds, such as LiF, NaF, BaO,Li_2O, Na_2O, other metal-florets, metal-oxides and metal sulfites, or a thin layer of inorganic metals or metal alloys.

36. The sensing element of claim 3, wherein optical mirrors are incorporated into the electrodes so that the mirror-organic material layer/mirror forms a microcavity and possess selective response at resonance wavelengths.

37. The sensing element of claim 36, wherein the optical mirrors comprise inorganic and/or organic insulating (dielectric) layers selected with different dielectric constants and arranged in alternating fashion to form a DBR mirror.

38. The sensing element of the claim 3, wherein the supporting substrate comprises switching circuits hybridized with the sensing element.

39. A pixelated photodetector comprising the sensing elements of claim 3.